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Editor
CHARLES H. KEENE, M.D.
University of Buffalo, Buffalo, N. Y.

Assistant Editor
EARL E. KLEINSCHMIDT, M.D.
Commissioner of Health, Toledo, Ohio

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Vol. XIII DECEMBER, 1943 No. 10

DENTAL CARIES: A SERIOUS HEALTH PROBLEM*

FRANCES KRASNOW, PH.D.

Assistant Director, School of Dental Hygiene, Head, Department of Biochemistry, the Murry & Leone Guggenheim Dental Clinic, New York, N. Y.

Dental caries control in children is the logical approach to problems of tooth trouble. Neglect to heed the exigencies arising at these early ages places the number of cavities on the march, geometrically increases difficulties of dental care, and only postpones the day of agony magnified manifold on the way from childhood to adolescence and thence to adulthood. The proportions of the handicaps encountered, disquieting as they may be normally, are brought into bold relief when the medical and dental examinations of selectees are evaluated.

Concerted efforts aiming to control dental caries in school children began to take root just about ten years ago. The viewpoints of different groups varied[1-6]. Organization of the Guggenheim Dental Clinic at this time peculiarly fitted the existing needs for greater over-all concentration on the problems involved. Coordination of courses in chemistry-biochemistry-histology-physiology for the curriculum in dental hygiene served very nicely as a foundation. Experiments and demonstrations set up for teaching purposes were generally focussed on newer knowledge and closely checked. Accumulation of data soon provided working hypotheses[7-11].

Biochemical Analyses Indicate Systemic Relationships.

Tabulations at intervals through the years—1936, 1938, 1942—show corroborative results. Aberrations in the chemical constituents of saliva set apart the caries-free and systemic-disease-free from caries-active or other ailments[8-12-13]. That this is especially true of protein, phospholipids and cholesterol with counterparts in the high blood levels of these compounds obtainable during infections and inflammations[14-16], marked activity[17-19], or pregnancy[20], lends weight to implications associating dental diseases with metabolic derangement. The cell changes entailed are so

* Read before the American School Health Association, New York, N. Y., October 11, 1943.

deepseated that the organism finds compensation difficult and it succumbs.

Into the category of increased energy output may be placed the rapid developmental early school age, puberty and adolescence. Frequently, these are periods of accelerated tooth decay. It may well be that metabolic readjustments burdened to capacity become overtaxed. When this occurs, physiological requirements fall far short of the optimum. These are not sufficiently marked in the caries syndrome to bring about blood level change since blood as the master fluid will tend to remain constant. Instead, the apparently asymptomatic abnormality may manifest itself in salivary aberrations.

Early Departure from Regular Daily Requirements.

The simplest way to control this condition is to avoid the onset. Such would not prove too difficult were the habits instilled at prenatal and baby clinics made life long. As it now happens, the mother-to-be heeds all cautions and continues to guard the advice for the baby's health. But little by little she forgets her needs. Slowly, too, the baby's routine is changed to fit the family activities so that he, also, becomes addicted to irregularities in meals, sleep, essential foods and general daily care, considered indispensable not long ago.

The extent to which shortcomings in this direction exist was evaluated from one angle by ascertaining the frequency of some protective foods. Summaries are presented in Charts 1 and 2 and Figures 1 and 2. Weekly dietary records secured along with medical-dental-laboratory histories according to Clinic routine were used to obtain the average daily portions employed in the calculations.

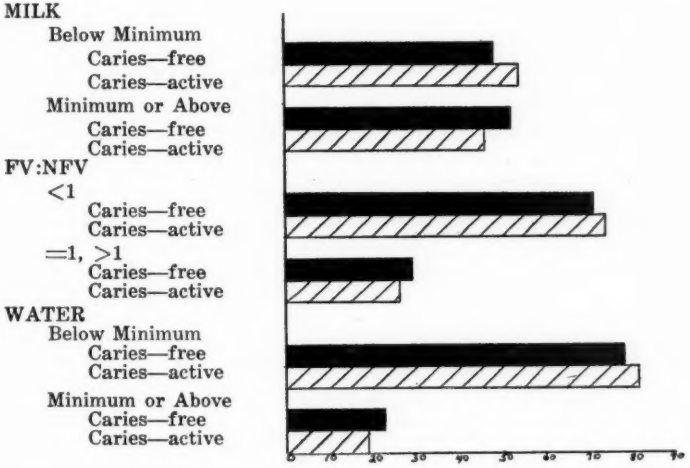
Milk Intake Significant.

Caries-free individuals lead in satisfying the milk requirements. This habit is exercised by 51.7 per cent of the group, exceeding by 6 per cent the practice among those with active caries. Figure 1. As a check on the significance of the figures and in order to obviate possible effects of special medical care necessitated by illnesses, similar tabulations were made for two series of subjects with no systemic involvements. When circumstances are so controlled, the frequency among those enjoying sound teeth is 55 per cent, that for individuals suffering from decay 36.6 per cent. Figure 2.

Data in Chart 2 correlating milk intake with age indicate that 40 per cent of caries-free pre-school children have at least the minimal 3 glass allotment, surmounting by 6.7 per cent the figure for children showing active lesions of the same level. Averages

FIGURE I

Frequency of Milk, Fruit-Vegetable Foods, Water For Cases Unclassified with Respect to Systemic Involvement



Percentage of Cases

FV—Fruit-vegetable foods
NFV—Non-fruit, non-vegetable foods

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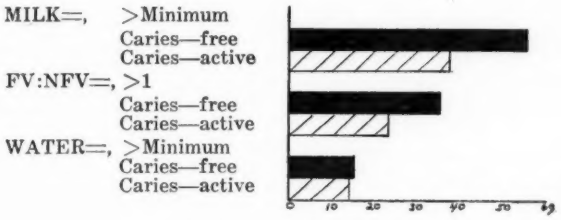
FIGURE 2

Frequency of Milk, Fruit-Vegetable Foods, Water For Cases Without Systemic Involvement



Percentage of Cases

FV—Fruit-vegetable foods
NFV—Non-fruit, non-vegetable foods

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through the eighth year demonstrate a rise of 52.6 and 41.2, respectively. School appears to be a distinct stimulus, but unfortunately only a transient one. The drop which soon begins, continues throughout adolescence. Nebulous, indeed, are the chances for optimal community health with disregard for a most necessary source of such nutrients as calcium and other minerals, complete proteins, fat, natural sugar, vitamins. Very few can remain resistant to disease on the basis of only early attention to protective measures.

Parallel Observations Regarding Fruits and Vegetables.

These observations for milk are paralleled by findings concerning fruits and vegetables, as may be again ascertained from Chart 1 and Figure 1. Somewhat greater proportions of caries-free individuals indulge in higher intake of fruit-vegetable foods and, of course, with them significant supplies of minerals, vitamins, natural sugar, roughage as well as other nutriments, not so usually referred to these sources. A considerable number of cases hover about the 1:1 point. Within the range FV:NFV=or >0.9 are found 48.4

CHART 1

EVALUATION OF WEEKLY DIETARY RECORDS FOR FRUIT-VEGETABLE, MILK, WATER INTAKE

Case Type	Number of Cases	Age Range	Milk Daily Average Portions			Ratio of Average Daily Portions Between Fruit-Vegetable Foods and Non-fruit, Non-vegetable							Water Daily Average Portions		
			Percentage												
			Below Approved Minimum	Approved Minimum**	Above Approved Minimum	>2:1	2:1	Between 2:1 - 1:1	1:1	Between 1:1 - 1:2	Between 1:2 - 1:3	<1:3	Below Approved Minimum	Approved Minimum***	Above Approved Minimum
UNCLASSIFIED WITH RESPECT TO SYSTEMIC INVOLVEMENT															
Caries-free	31*	3-20	48.4	6.5	45.2	0	0	16.1	12.9	51.6	16.1	3.2	77.8	11.1	11.1
Caries-active	306†	2-35	54.2	6.7	39.1	1.0	1.0	18.3	5.6	60.1	10.1	3.9	81.5	10.8	7.7
WITHOUT SYSTEMIC INVOLVEMENT															
Caries-free	20††	2½-21	45.0	10.0	45.0	0	0	25.0	10.0	50.0	15.0	0	84.2	5.3	10.5
Caries-active	181†††	2½-34	63.4	6.3	30.3	1.1	1.1	16.5	4.4	63.0	11.0	2.7	82.2	10.9	7.0

* 27 cases for water

** Approved minimum of milk; child—3 glasses daily; adult—2 glasses daily

*** Approved minimum of water: up through 10 yrs.—5 glasses daily; 11 yrs. and over—6 glasses daily

† 299 cases for milk; 286 for water

†† 16 cases for water

††† 175 cases for milk; 162 cases for water

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per cent of the group free from decay in contrast to 34.3 per cent of those suffering from the disease. Chart 2. Fruits and vegetables, too, seem to become less prominent during puberty and adolescence. There is indication, however, that divergence between the two groups is most marked in pre-school children at which time those with sound teeth show a 31 per cent higher frequency of fruit-vegetable food intake. Furthermore, comparison of figures for cases without systemic disease again demonstrates that a higher percentage of the caries-free than of caries-active individuals take the greater amounts of fruits and vegetables.

The lower of the proportions mentioned are not the recommended ones. Clinic prescriptions usually aim toward a 1.5:1 or 2:1 relationship between portions of fruit-vegetable foods and non-fruit, non-vegetable varieties. Not only from experiences here[13], but also from other institutions there has been accumulating evidence that adequate preponderance of potentially alkaline foods aids in the body economy[6, 21, 22].

Water Intake Important.

Water is exhibited in Chart 1 and Figure 1 as a striking example of an important food element which can be had by virtually everyone at no additional cost and yet is not taken advantage of. The requirement is mainly viewed empirically although it is well known that the body water weighs approximately 41 kilo-

CHART 2

Milk, Fruit-Vegetable and Water Intake at Different Ages

Food Type	Tooth Involvement	Percentage of Age Group					
		2½-5	2½-8	9-12	13-16	17-20	21+
MILK (to drink) Minimum or greater*	Caries-free	40.0	52.6	25.0	0		
	Caries-active	33.3	41.2	27.0	31.2	11.1	31.3
FV:NFV=,>0.9	Caries-free	83.3	52.4	20.0	33.3		
	Caries-active	52.4	46.5	24.7	23.7	47.1	31.6
WATER Minimum or greater**	Caries-free	50.0	27.3	20.0			
	Caries-active	19.0	14.1	19.8	8.5	19.8	26.3

* Three glasses for children, two for adults

** 2½-3 years—3 glasses; 4 years—4 glasses; 5 to 10 years—4 to 5 glasses; above 10 years—6 glasses

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grams, is a medium for metabolic reactions, regulates temperature, acts as a lubricant, removes wastes and serves as a building material. Also, very recent investigation has shown that low water intake may precipitate symptoms similar to vitamin deficiency[23, 24].

Thirst can hardly be considered the only guide when over 75 per cent do not take the amount necessary to replace the volume normally excreted. Data in Chart 1 and Figure 1 present the caries-active with 18.5 per cent adequately supplied trailing behind the caries-free with 22.2 per cent. Similarly low but in reversed relationship is the variation when cases with no systemic trouble are studied as in Chart 2 and Figure 2. However, if intake is correlated with age, a high point parallel to that which obtains for fruit-vegetable foods occurs at the pre-school level of caries-free children. The frequency then drops abruptly during the 6th to 8th year and continues low in both series.

Cod Liver Oil Needed.

Cod liver oil or other vitamin D preparations appear extremely infrequently, not more than to the extent of a fraction of one per cent. This disregard grew out of the assumption that during childhood the need for vitamin D is less than in infancy. Experimental evidence to support the supposition is meager. Contrarily, numerous reports of poor skeletal and dental development on deficient diets attest to the probability of vitamin D. inadequacy[22].

Protein per se has not entered as a problem. However, in some instances, the preponderance of the daily consumption obtained from grains may give rise to a shortage of essential amino acids. Tabulations from this viewpoint are not yet completed.

These findings may be interpreted as the habit cross-section of a mixed population. The data were consummated at the Clinic, studies on children between 2 and 16 years registered at the Clinic, and on patients referred for consultation by other institutions and from private practice. Ages ranged from 2 to 35 years, the large majority below 20; economic strata varied from the poorest clinic case to the well-to-do; intelligence and education levels likewise graded between the extremes.

Nutrition Regulation to Meet the Challenge.

Nutrition regulation was introduced as the most probable means of meeting the challenge. It involves medical, dental and laboratory control to provide qualitatively and quantitatively all nutrient essentials with stress no less on potential positive-negative ion balance, rest and other daily physiologic needs. Patients or guardians are supplied, usually personally, with itemized prescriptions[13]. Explanations are detailed. Attention is concen-

trated on overcoming problems of progressive modification of requirements in a family group, circumventing established custom, market availability of recommended foods, fluctuating prices. Necessity for change is manoeuvered psychologically by emphasizing first, the good points in the patient's own habitual routine; second, that variation would aid health generally in addition to safeguarding the teeth; third, the low cost and ease of preparing suggested foods; fourth, simplicity of following the sample menu formulated for each case, the pattern being that in Chart 3.

It is helpful to realign the concepts concerning substitution of foods within their respective groups—especially to counteract the tendency of using rice, corn, macaroni, spaghetti to replace potatoes, carrots, turnips; to effect choosing raw fruits and vegetables instead of cooked ones; to dispense with the wastefulness of relegating carrot, radish, beet, turnip, cauliflower greens to the garbage can. Also, foods are reclassified as (1) milk and its equivalents except for fat value—buttermilk or skimmed milk, (2) fruits-vegetables, (3) non-fruits, non-vegetables—meat, fish, eggs, cheese, grain products including rice and corn, (4) fish oils, (5) water.

A sample daily menu for school children of ten embodying the principles outlined, is given in Chart 3. Similar representative ones have been developed for other members of the family—the

CHART 3

SAMPLE MENU FOR TEN YEAR OLD CHILD

Time	Food	Portion
At Rising	Water	1 glass
Breakfast	Cod liver oil	1 tsp
	Cereal, whole grain, with	1 cup
	Evaporated milk, see note 1	½ cup
	Molasses	4 tsp
	Cocoa with	1 tsp
	Evaporated milk, see note 1	½ cup
	Sugar	1 tsp
Mid Morning	Water	1 glass
Lunch	Raw vegetable salad of	
	Carrot	1 medium
	Leafy greens	½ cup
	Butter	1 pat
	Potato	1 medium
	Bread, whole grain, 24 hours old	2 slices
	Raw fruit in season	1 medium
	Cocoa with	1 tsp
	Evaporated milk, see note 1	½ cup
	Sugar	1 tsp
	Water	1 glass
Afternoon	Fresh milk	1 cup
	Bread, whole grain, 24 hours old	1 slice
	Butter	1 pat
	Water	1 glass
Dinner	Split pea soup made with	
	Split peas	¼ cup
	Evaporated milk, see note 1	¼ cup
	Egg, 4 times weekly, substituted by	1
	Meat, twice weekly	2½ oz
	Fish, once weekly	2½ oz
	Turnip	2/3 cup
	Bread, whole grain, 24 hours old	2 slices
	Butter	1 pat
	Raw fruit	1
	Water	1 glass

NOTE:
1 Diluted equally with water.
2 Meals or parts of meals may be interchanged
3 General rule: 1½ to 2 portions of fruit-vegetable foods to 1 portion of non-fruit, non-vegetable foods.
4 Candy, ice cream, cake, and crackers should be excluded.

Approximate total calories 1800
Approximate cost 28 cents*

* Range between 28-34 cents covers fluctuating prices from June 1942 to September 1943

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one year old baby, the pre-school child of five, 15 year old boy and girl, man, woman, and for late pregnancy. In order to establish their adequacy, the total content of constituent nutrients was estimated as summarized in Charts 4 and 5. Calculations were made from published analyses[14, 25-30].

Prominence is allocated to seasonal and inexpensive food, our policy here since early in the thirties has even greater implications at this moment of urgent manpower conservation, lend lease, war bond saving. Stress on (1) increase use of raw vegetables and fruits, (2) less elaborate roasting and frying, (3) more simple pan broiling of thin meat or fish cuts saves fuel for victory, vitamins and other nutrients for health, time and energy for work, more money for bonds.

Figures for fruits and greens in Chart 4 and 5 are averages of the usual ones—oranges, apples, bananas, when available, and

CHART 4
SAMPLE MENU FOR TEN-YEAR OLD CHILD: DETAILED ANALYSIS OF INORGANIC INTAKE

Time	Foods	Portion	Calories	Grms of Water	Grams									Excess Milliliters	
					Potassium	Sodium	Calcium	Magnesium	Iron	Copper	Manganese	Chlorine	Sulphur	Phosphorus	Normal Acid	Normal Base
Upon Rising	Water	1 cup		227												
Breakfast	Cod liver oil	1 tsp	50													
	Cereal, oatmeal	1/3 cup*	100	150	.086	.016	.017	.028	.0010	.0002	.00124	.017	.051	.098	4.0	
	Evaporated milk	1/2 cup	85	106	.175	.062	.146	.015	.0003			.129	.042	.114		2.6
	Molasses	4 tsp	60	6	.267	.004	.042	.013	.0014	.0004		.063	.026	.009		12.0
	Cocoa	1 tsp	13		.025	.002	.003	.012	.0001	.0009		.001	.006	.020		
	Evaporated milk	1/2 cup	85	106	.175	.062	.146	.015	.0003			.129	.042	.114		2.6
	Sugar	1 tsp	17													
Mid Morning	Water	1 cup		227												
Lunch	Carrot	1 medium	35	84	.204	.072	.040	.017	.0005	.0001	.00018	.026	.016	.033		9.6
	Greens	1/2 cup	12	42	.129	.012	.027	.021	.0006	**	.00020	.022	.018	.016		5.8
	Butter	1 pat	50	1	.001	.067	.001	**				.103	.001	.001		
	Potato	1 medium	100	64	.562	.018	.012	.024	.0009	.0001	.00018	.032	.026	.049		7.1
	Bread, whole seed	2 slices	140	20	.106	.221	.028	.028	.0008			.340	.067	.098	4.4	
	Fruit	1 medium	87	106	.280	.022	.029	.019	.0006	.0001	.00026	.047	.022	.026		7.6
	Cocoa	1 tsp	13		.025	.002	.003	.012	.0001	.0009		.001	.006	.020		
	Evaporated milk	1/2 cup	85	106	.175	.062	.146	.015	.0003			.129	.042	.114		2.6
	Sugar	1 tsp	17													
	Water	1 cup		227												
Afternoon	Fresh milk	1 cup	170	212	.349	.124	.293	.029	.0006	.0001	.00001	.259	.063	.227		5.1
	Bread, whole seed	1 slice	70	10	.056	.110	.014	.014	.0004			.170	.034	.049	2.2	
	Butter	1 pat	50	1	.001	.067	.001	**				.103	.001	.001		
	Water			227												
Dinner	Split pea soup	1/4 cup*	79	57	.199	.023	.019	.033	.0013	.0002	.00044	.008	.048	.088		1.6
	Evaporated milk	1/4 cup	42	53	.087	.031	.073	.007	.0001			.065	.021	.057		1.3
	Egg***	1	70	39	.074	.076	.036	.006	.0016	.0001	.00002	.156	.103	.095	5.6	
	Turnip	2/3 cup	32	68	.307	.051	.058	.015	.0004	.0001	.00008	.037	.059	.042		15.4
	Bread, whole seed	2 slices	140	20	.106	.221	.028	.028	.0008			.340	.067	.098	4.4	
	Butter	1 pat	50	1	.001	.067	.001	**				.103	.001	.001		
	Fruit (apple)	1	80	107	.161	.014	.009	.010	.0005	.0001	.00011	.006	.008	.015		4.8
	Water	1 cup		227												
Total			1732	2465	3.353	1.405	1.175	.359	.0126	.0030	.00275	2.287	.785	1.384	20.5	78.1
NRC Values			2500				1.2		.012							

* Figures are for uncooked oats and peas

** Too low for decimal places allowed here

*** Substituted by 2.5 ounces meat twice weekly and 2.5 ounces fish once weekly

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beet tops, cabbage, lettuce. Conscious grouping of fruits and vegetables together as having similar food value makes for freer interchange with consequent considerable saving when price differences are large.

Vitamin D inclusion in all menus has always been another of our mainstays. Support for this practice in recent reviews on the subject is encouraging [22, 33]. It is recorded as an average of four brands of cod liver oil with unitage per gram varying from 85 to 350. Fish oil is the surest source, and would not introduce any problem of acceptance if it were not interrupted once the child has been trained to accept it through the infancy period. As lay understanding progresses and dosage is more definitely known, enriched foods might be employed to lower the daily food cost by approxi-

CHART 5

SAMPLE MENU FOR TEN YEAR OLD CHILD: DETAILED ANALYSIS OF ORGANIC INTAKE

Time	Foods	Portion	Calories	Grams			Grams of Fiber Roughage Foods	Vitamins					
				Carbohydrates	Fat	Protein		A** IU	B_1 Mg	B_2** Mg	Nicotinic Acid Mg	* C Mg	D IU
Upon Rising	Water	1 cup											
Breakfast	Cod liver oil	1 tsp	50		5.70			8,027					1068
	Cereal, oatmeal	1/3 cup*	100	16.60	1.84	4.16	.25	Trace	.14	.02	1.09		
	Evaporated milk	1/2 cup	85	6.12	4.98	4.30		272	.03	.15	.09	.8	2
	Molasses	4 tsp	60	13.70		0.46							
	Cocoa	1 tsp	13	.93	.47	0.47							
	Evaporated milk	1/2 cup	85	6.12	4.98	4.30		272	.03	.25	.09	.8	2
	Sugar	1 tsp	17	4.80									
Mid Morning	Water	1 cup											
Lunch	Carrot	1 medium	35	7.25	.31	0.78	.78	1,149	.04	.04	.35	3.6	
	Greens	1/2 cup	12	2.02	0.15	0.70	.40	902	.03	.09	.14	18.0	
	Butter	1 pat	50		7.22	0.06		204					7
	Potato	1 medium	100	15.62	.08	1.87	.34	26	.10	.04	1.70	10.7	
	Bread, whole seed	2 slices	140	29.80	.60	5.8	.68	Trace	.17	.05	1.68		
	Fruit	1 medium	87	18.68	.51	1.07	1.27	235	.08	.05	3.23	28.9	
	Cocoa	1 tsp	13	.93	.47	0.47							
	Evaporated milk	1/2 cup	85	6.12	4.98	4.30		272	.03	.25	.09	.8	2
	Sugar	1 tsp	17	4.80									
	Water	1 cup											
Afternoon	Fresh milk	1 cup	170	11.78	9.76	8.30		427	.15	.55	.17	3.1	5
	Bread, whole seed	1 slice	70	14.90	.30	2.90	.34	Trace	.08	.02	.84		
	Butter	1 pat	50		7.22	0.06		204					7
	Water	1 cup											
Dinner	Split pea soup	1/4 cup*	79	13.65	.24	5.43	.39	263	.11	.07	1.24		
	Evaporated milk	1/4 cup	42	3.04	2.49	2.15		136	.02	.13	.04	.4	1
	Egg***	1	70		5.62	7.10	.96	530	.06	.17	.05		
	Turnip	2/3 cup	32	6.44	.12	1.00	1.00		.04	.04	.46	27.2	
	Bread, whole seed	2 slices	140	29.80	.60	5.80	.68	Trace	.17	.05	1.68		
	Butter	1 pat	50		7.22	.06		204					7
	Fruit (apple)	1 medium	80	17.03	.64	.51	1.63	95	.06	.04	3.23	6.4	
	Water	1 cup											
Total			1732	230.13	66.56	62.05	8.72	13,218	1.55	2.12	16.17	100.4	1101
				53.1%	34.5%	14.3%							
RDC Values 32/			2500			70		4,500	1.20	1.8	12	75	400-800

* Figures are for uncooked oats and peas.

**IU = International Units; Mg = Milligrams

*** Substituted by 2.5 ounces meat twice weekly and 2.5 ounces fish once weekly

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Guggenheim Dental Clinic
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mately 2 to 4 per cent. Inclusion of fish oils increases the vitamin A allotment substantially.

Evaluation of the caloric need of the subjects studied seemed to indicate a lower level than generally considered necessary. An analysis of a representative series of 467 cases is tabulated in Chart 6. Our menus run well ahead of these figures. Actually, the extra allowances range from 10 to 70 per cent depending upon age, sex and activity, securing a safe total for the family group. Until higher intakes are proven beneficial, it is deemed wise to keep to the status quo because added calories are not always health calories, especially so now when food shortages exist and expenditures must be budgetted. Close attention should be paid always to maintaining the portion ratio of fruit-vegetable foods to non-fruit, non-vegetable varieties between 1.5 to 1 and 2 to 1.

CHART 6

CALORIC INTAKE AT DIFFERENT AGES

Case Type	Number of Cases	Age	Sex	Caloric Intake		
				Presented Data	Sample Menu Level	National Research Council Values
CARIES-FREE	11	4-6	♂+♀	1358	1506	1600
	9	7-9	♂+♀	1514		2000
	4	10-12	♂+♀	1418	1732	2500
	1	16-20	♀	1271		2400
	1	Adult	♀	1463	2033	2100-(Sedentary)
CARIES-ACTIVE	25	4-6		1340	1506	1600
	62	7-9		1494		2000
	60	10-12		1556	1732	2500
	29	13-15	♂	1673	2501	3200
	19	13-15	♀	1585	2033	2800
	7	16-20	♂	2082		3600
	52	16-20	♀	1436		2400
	10	Adult	♂	1628	2796	2500-(Sedentary) 3000-(Mod. Active)
	27	Adult	♀	1361	2033	2100-(Sedentary)
STUDENTS	130	16-20	♀	1542		2400
UNCLASSIFIED	30	Adult	♀	1477	2033	2100-(Sedentary)

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Consistent Adherence to Recommendations Important

Patients and parents can be guided into new ways, apparently regardless of the nature of the handicaps. A recent compilation may be used to exemplify the beneficial effects. Of 87 individuals who have different home environments and varying amenability to cooperation, 84 per cent experienced systemic and dental improvement, 43 per cent obtained dental improvement. The series as presented in Figure 3 shows parallel results for the caries and erosion subgroups into which it was divided and serves to demonstrate the generality of effects.

When adherence slackens, there is a corresponding increase in tooth decay as shown in Figure 4. Only partial regulation could be enforced in these cases, but after 7 months 42.8 per cent of the group between 7 and 12 years, and 31.8 per cent of those 13 to 17 years of age were caries-free. The younger set had their food apportioned, all took cod liver oil. Contrarywise, the older children had platter service allowing for freedom in food choice; some did not take cod liver oil; often lunch money was used for cake, candy, ice cream instead of milk. Further difficulties in controlling the dietary regime arose. During the corresponding period a progressively increasing number of decayed teeth were found as is portrayed in Figure 4.

FIGURE 3

Improvement With Varying Degrees of Cooperation

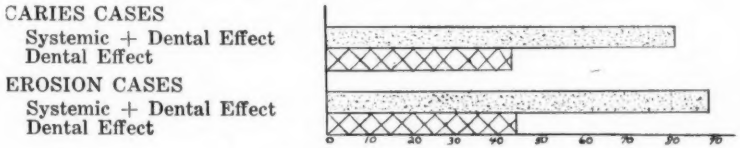

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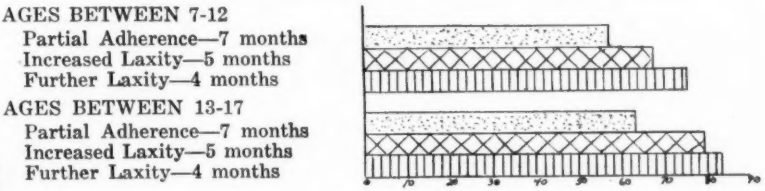
FIGURE 4

Rise in Caries Incidence With Decreased Cooperation



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Educational Guides.

The one common path for bypassing numerous conditions and circumstances is through education—conveying to all the whys and answers. Newer knowledge should be made available to the lay person as well as the professional by adequate distribution of material which is abreast of current ideas. Several charts have

been drawn up for the purpose. Each may be converted into booklet forms attractive to lay groups:

* (1) **Teeth Need Care,** Chart 7, emphasizes the need for continuity of training begun during childhood, a goal which ought to be widespread. Otherwise, the benefits of prenatal and baby care often dwindle to ineffectiveness. The regular living of healthy, energetic childhood must be continued to make the child capable of ripening into buoyant, ambitious adolescence and then to mature into well-developed, productive adulthood.

Chart 7

TEETH NEED CARE

Start With The Baby Teeth
Because they are needed for
healthy jaw development
safeguarding correct spaces for permanent teeth; avoiding likelihood of shifted and crooked teeth
good chewing and digestion
strong gums
a healthy body free of harmful germs

It Is Necessary To
Continue to take the child to the physician once a year
Let the dentist examine his mouth when he is two, earlier would be better, then revisit the dentist every six months
Give him abundant fresh air during sleep as well as play
Continue his regular and abundant rest

And—
Mother: This is how you can help still more!
Father: So can you.
See that your child keeps all appointments. If your child cannot keep an appointment please ask for another date.
Teach your child to brush his teeth at least after morning and evening meals.
Make home pleasant and peaceful.
Give him daily the right foods in right portions; avoid the wrong.
Come to us for more information.

(2) **Watch Your Health,** Chart 8, is a general summary of the principles set forth. It has served as a guide for talks to various groups. Details have been suited to the audience.

(3) **A Sample Menu,** Chart 3, as previously discussed, advocates seasonal and inexpensive foods, a policy expedient always but with particular implication at this moment when conservation is imperative. General rules, approximate calories and cost range are included.

(4) **A Weekly Food Order For A Family Of Five,** Chart 9, serves as a memorandum of needed purchases for a family with 5, 10 and 15 year old children, the latter a boy so that maximum allowance is made. The two price lists show a fluctuating total ranging from $10.85 for June 1942 to $12.90, September 1943.

(5) **Economy Vitamin-Mineral Rich Recipes With Greens** for salads, soup, meat pie, chili con carne, Charts 10-14, suggest simple

ways of using frequently discarded vegetable tops in cold and warm dishes for the year round. The recipe for **Fruit Balls**, Chart 14, gives a nice dessert when fresh fruit is expensive.

(6) **Score Tally For Daily Nutrition Needs,** Chart 15, is a means of determining degree of adherence to recommended standards. This responsibility can be taken by everyone. Equal percentage is assigned to ten groups of essentials thus making up 100 per cent with no place for unnecessary goods.

Hypotheses on Dental Caries Met.

The possibility of therapeutic alleviation of local damage[34, 35] notwithstanding, principles herein set forth are fundamental for

Chart 8

GUARD YOUR HEALTH

I Plan so that
Your money will go farther
Your energy will be saved

II Use daily proper food portions

Milk: Evaporated or Fresh Pasteurized
Children: 3 to 4 glasses; Adults: 2 glasses

Cod liver oil: 1 teaspoonful for everybody

Vegetables: 1 potato; 1 portion of green leafy vegetables, frequently raw; 1 portion of carrots, beets, or turnips, frequently raw. Learn to eat 2 fruits and 2 vegetables raw. Wash them well but do not soak them long

Fruits: 8 oz. (grapefruit, canned tomato, or orange juice), or one citrous fruit, one other raw fruit in season

Egg: 1 brown or white, for very low income 4 weekly

Meat or fish: 3 ounces, bought sliced thin, steamed (pan broiled) 20 minutes

Dark bread: 2 slices; dark cereal: 1 cupful

Butter: 1 ounce; in emergency substituted by meat fat

Water: 6 glasses

When more food is needed, take 1½ portions fruit-vegetable foods to each portion of non-fruit, non-vegetable food

Fruit-Vegetable Portions	Non-fruit, Non-vegetable Portions
1 apple, orange, pear	2½ ounces meat or fish
1½ peaches or apricots in season	1 egg
1 medium potato	1 inch cube pressed cheese or ½ cup cottage cheese
½ cup greens of beets, carrots, turnips, radishes	2 slices dark bread
Similar foods except prunes and corn	½ cup dark cereal
	Similar foods of non-fruit, non-vegetable type

III Have regular and sufficient rest—enough to take you through daily tasks, including recreation without feeling tired
IV Have abundant fresh air—work, play, sleep with windows open
V Avoid self-prescribed proprietary preparations—medicines, vitamin concentrates
VI Chase germs with cleanliness
VII Have regular annual medical check
VIII Have regular dental examination every six months
IX Obtain information from authorized sources—your Physician, Dentist, School, Health Center, Dental Clinic, American Medical Association, American Dental Association
X Health costs less than sickness

optimal continuity of organic processes. They help to integrate dental with general health programs and to conserve time, energy and funds. The mehods recommended apparently satisfy necessary procedures of dealing with the various hypotheses for caries prevention. Thus, there is very little possibility for (1) mechanical damage due to large particle size of hard foods[36, 38] with the prac-

Chart 9

WEEKLY FOOD ORDER FOR A FAMILY OF FIVE

Foods	Actual Amounts	Purchase List	June 1942 Price	June 1943 Price
MILK				
Approved, bottle	5 qts., ½ pt.	5 quarts	.60	.70
Evaporated milk (14½ oz.)	24.1 cans	24 cans	2.00	2.40
VEGETABLES				
Fresh carrots, beets, onions, turnips	11.1 lbs.	11 lbs.	.61	.99
Fresh cabbage, beet tops, greens	4.2 lbs.	4 lbs.	.24	.32
Canned tomatoes (No. 2 can)	16.1 oz.	12 oz. can	.11	.14
Dried peas and beans	2.7 lbs.	3 lbs.	.32	.36
Potatoes	10.5 lbs.	10.5 lbs.	.42	.63*
FRUIT				
Fresh oranges, apples, fruit in season of same price range	26.7 lbs.	27 lbs.	2.30	2.97*
CHEESE	4.2 oz.	4 oz.	.06	.09
EGGS—Grade B	20	20	.62	.78
MEAT	1.6 lbs.	2 lbs.	.54	.60
FISH	.9 lbs.	1 lb.	.16	.18
BREAD AND CEREALS				
Bread, whole wheat, 24 hours old	14.6 lbs.	15 lbs.	.99	.99
Dark cereals—oatmeal, wheatsworth, etc.	1.9 lbs.	2 lbs.	.20	.18
White cereals—macaroni, rice, etc.	1.6 lbs.	2 lbs.	.19	.20
BUTTER AND FATS				
Butter	31.5 oz.	2 lbs.	.84	1.02
Oil	1.75 oz.	2 oz.	.03	.05
Cod liver oil	5.00 oz.	5 oz.	.30	.40
SUGAR	.7 lb.	1 lb.	.06	.07
MISCELLANEOUS				
Cocoa	6.3 oz.	8 oz.	.08	.17
Coffee	.7 oz.	1 oz.	.02	.03
Molasses	22.1 oz.	1 can (19 oz.)	.16	.20
			$10.85	$13.47*

* At least 57 cents may be deducted from total for reduced prices of these

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Chart 10

ECONOMY VITAMIN-MINERAL RICH SALAD RECIPES FOR ALL GREENS

Green Salad—any mixture of the following with or without dressing as taste requires. If dressing is used, it should be of the very dilute type; e.g., in the case of mayonnaise, take 1 portion to 4 of water and stir to uniform consistency.

Grated or shredded cabbage
Celery leaves cut fine
Radish leaves cut fine
Beet leaves cut fine
Carrot leaves cut fine, not stems
Any other greens

Salmon, Tuna Fish, Egg or Chicken Salad

Any of the greens used in the green salad may be cut particularly fine and mixed with the salmon or tuna fish in proportion of half fish to half greens. For this mixture, additional flavor (especially when habit is being formed) is obtained by dicing in some celery. All juices should be used.

For devilled eggs, finely chopped greens may be mixed in as fillings.

Sardine-Egg Salad

It is a very tasty change to mash sardines and eggs with the greens as prepared for the salmon. All the oil from the sardines should be included.

Chart 11

ECONOMY VITAMIN—MINERAL SOUP RECIPE WITH GREENS

Any or a combination of greens from

Cabbage
Celery
Radish
Carrot leaves or others in season

except rhubard leaves can be put through meat chopper or other masher. The entire pulp may then be used to make purees or thin soups as taste requires. This pulp may be variously combined with lentils, peas, potatoes, carrots or any combination of them. Lentils give a flavor simulating that of meat which is very desirable.

Chart 12

ECONOMY RECIPE FOR VITAMIN-MINERAL RICH MEAT PIE WITH GREENS

Prepare

(1) 3 pounds mashed potatoes with skins or raw put through meat chopper, seasoned to taste.

(2) ¾ pound cooked chopped meat or meat cubes mixed with ¼ pound lentils, 1 cup finely cut or chopped greens of celery, carrots, beets, cauliflower or any other in season and 1 onion (if desired) seasoned to taste.

(3) ½ pound cooked cut string beans, diced carrots or turnips.

Place into hot greased pan as follows:

Layer first ½ of the potatoes, then ½ of the string beans or substitute. Now spread the meat mixture, upon it the second half of the string beans and last the rest of the potatoes.

Bake in ovenette at ¾ heat for approximately an hour.

Divide into 4 large or 5 medium portions.

* The meat can be cooked in water sufficient to make 4 or 5 portions of broth.

tical elimination of crackers, (2) vitamin or mineral starvation[2, 3, 6] with abundant inclusion of natural sources, (3) greatly elevated local acidity[5, 39] when easily fermentable carbohydrates from candy and cake are generally off the food roll. Yet, spontaneous cleansing and jaw exercise are well provided for by the raw fruits and vegetables.

Effort of All Agencies Called For.

In conclusion, dental caries control in school children, as the salient area of attack on the most widespread disease in many parts of the world calls for the efforts of all agencies—the prenatal clinic (not excluding the family physician, obstetrician or dentist in private practice), the child health station or pediatrican and pedodontist in private practice, the school with its many departments, the community center. While attention is focused on the child, the unit of influence is the family group. Though, of necessity, the mother is first informed, the father's role should not be overlooked.

Educational programs can be effective in seeking to instill in all groups—lay, professional, industrial—genuine consciousness that the foundation for sound teeth is laid in the healthy development of the child. Furthermore, sound teeth will have the chance

Chart 13

ECONOMY VITAMIN-MINERAL RICH CHILI CON CARNE RECIPE WITH GREENS

Prepare

(1) 1 pound cooked meat cubes.*
(2) 1 pound cooked kidney beans.*
(3) 1-2 cups of mixed greens from beets, cabbage, carrots, cauliflower, celery or others in season finely cut. If desired diced vegetables may be included.
(4) Two tablespoonfuls flour made into thin paste with 4 ounces water.

Mix all of these with one-half cup broth from the meat and one-half cup bean water. Allow to boil gently over low heat approximately one-half hour. Fold in paste while adding with fine stream. Continue heating 15 to 20 minutes.

This will make 8 to 9 large portions. Left-overs may be jarred, covered with wax paper, iced and warmed over hot water when used.

* The meat and beans can be cooked in water sufficient to make 5 portions of rich broth.

Chart 14

RECIPE FOR FRUIT BALLS

Prepare

(1) Rinds of 3 to 4 oranges or equivalent grapefruit or lemon
(2) One-half pound of raisins
(3) One-quarter pound of prunes
(4) One-quarter pound of peanuts or any other easily available nut
(5) Juice of one orange or one-half grapefruit (3 to 4 ounces).

Grind through meat chopper the prunes, raisins, rind and ¾ of nuts. Mix well with juice. Make into balls about the size of a walnut and roll in ground nuts. Place on wax paper and allow to dry over night before serving.

to remain so, when the needs for such healthy development are realized as basic for optimal well-being throughout life.

Chart 15

SCORE TALLY FOR DAILY NUTRITION NEEDS

A Means of Determining Degree of Adherence to Recommended Standards

1. Milk—Evaporated or Fresh Pasteurized or equivalent dried milk powder 10%
   Children—3 to 4 glasses
   Adults —2 glasses
2. Cod liver oil—1 teaspoonful for everybody 10%
3. Vegetables—in season, frequently raw 10%
   1 potato (rice, corn, macaroni or other grain products are not substitutes for potato)
   1 portion of leafy vegetables or leafy tops
   1 portion of carrots, beets or turnips
4. One citrous fruit or 8 oz. grapefruit, canned tomato, orange juice..... 10%
   One other fruit in season, often raw
5. One egg, at least 4 weekly 10%
6. Three ounces of meat or fish—Fresh, inexpensive varieties match the food value of those higher in price 10%
7. Two slices of dark bread; one portion dark cereal 10%
8. Two tablespoons butter or meat fat 10%
9. Water—3 glasses at 3 years, 4 between 4 and 10, six thereafter..... 10%
10. Rest 10%
    Children, 10-12 hours
    Adults, 8 hours

INTELLIGENT CHOICE SECURES ALL THESE AT LOW COST: Respectively 23-26, 26-31, 28-34, 31-42, 31-49 cents for the 1, 5, 10, 15 year old levels and adults.

A GOOD RULE TO FOLLOW IS: Take 1½ portions fruit-vegetable foods (frequently raw) to each portion of non-fruit, non-vegetable ones. Restrict sugar to natural sugars in fruits, certain vegetables, molasses, honey and brown sugar. Candy, ice cream, cake, crackers, pastries, puddings, so-called soft drinks should be excluded.

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NEW OFFICERS

Readers will note the changes in the list of officers of the Association as printed on the inside of the front cover of this issue.

Under our Constitution, the President-elect of last year, *C. Morley Sellery, M.D.*, of Los Angeles Public Schools becomes President. Dr. Sellery has had long and intimate experience in school health work, as school physician, as Assistant Director under Dr. Sven Lokranz, and for the past two years as Director, Health Service Section, in the city schools.

S. B. McPheeters, M.D., Director of Public Health of Wayne County, Goldsboro, N. C., was chosen President-elect.

Dr. McPheeters, one of the organizing members and a fellow of the American School Health Association, has a long and splendid record in the field of public health. Under the North Carolina organization, the county Director of Public Health is in charge of school health activities as well as of the other parts of the community health program.

Dr. McPheeters has an A.B. degree from Washington and Lee University; M.D. from Washington University, St. Louis; taught English and English History in Smith Academy, St. Louis, three years; member of Phi Gamma Delta, Nu Sigma Nu, Alpha Omega Alpha; three years Medical Department, U. S. Army, two years of this in Philippine Islands; post graduate study in Medical College of Virginia; courses, Trudeau School of Tuberculosis, Saranac Lake, New York, and in Diseases of Chest, Bellevue Hospital, New York; Associate Physician, Virginia State Tuberculosis Sanatorium; Chief Clinician, Mobile Chest Clinc, Alabama State Board of Health; Consultant, Diseases of Chest, Charlotte, N. C.

Helen A. Cary, M.D., Physician Director, Division of School Hygiene, City Health Department of Portland, Oregon, has been appointed by President Sellery as Chairman of the Program Committee.

The American School Health Association is, indeed, fortunate to have these three efficient officers in charge of its destiny.

SEX PROBLEMS AND THE TEACHER

ARTHUR R. TIMME, M. D.
Psychiatrist, Los Angeles Public Schools and Pasadena Child Guidance Clinic

There are many phases of sex, which come up in the daily work and experiences of school people. These range from the shock experienced by the kindergarten teacher on discovering that some youngster is "masturbating," all the way to the choice of proper material to be used in talks on sex hygiene to high school seniors. We meet almost as many attitudes on the subject as we meet people who discuss their problems. On the one extreme are those who horrifiedly close their eyes to the very existence of sex; on the other, those who buttonhole you with a new "story" every time they come into the office. Both these conditions are expressions of an unwholesome attitude—opposite facets of the same thing. There are those honest and well-meaning folk who think nothing of discussing intimate sex details under the mistaken guise of scientific objectivity almost anywhere or under any and all circumstances. And there are those who can take a rational and sensible middle road between extremes, maintaining a calm and objective appreciation of facts as they exist, and yet not losing those feelings of decency and modesty which are part and parcel of our present cultural level.

Attitudes.

The many phases of sex that crop out in the general educational field are beyond the scope of this short paper. Of prime importance are our own attitudes toward this complex subject, the attitudes of those of us who are called upon to deal with these various phases as they come up from day to day. Attitudes are deeply rooted, those toward sex especially so; objective and scientific as we may desire to be, there can always be a little catch or hesitance when answering the honest and ingenuous questions of a youngster. Understandably so, and probably rightly so. These attitudes are formed back in childhood, and are deeply ingrained in our thinking and feeling. Only with the greatest difficulty are they changed by conscious effort—sometimes never. I also said "probably rightly so." Some of my scientific friends mav raise an eyebrow at this. But stop to consider. The story of civilization is one of progressive curbing of the instincts. Not only are the instincts curbed, but they are marshalled in the interests of group life. Free expression of instincts has had to meet some taboos—we eat, work, sleep, eliminate and procreate according to rules and regulations today. That is why we are "civilized"—we have paid

a price for the advantages of being civilized and that price is a curb on the free expression of instinct, particularly sex. That is why sex and sex activity are invested with so much of the repressive, suppressive, and "hush-hush." So if you are somewhat hesitant or embarrassed anent free sex discussion in a group, don't feel guilty or inferior over it. There is a reason for it and a good one.

But you will frequently be called upon to take a hand in directing a child's attitude toward sex. Innocent questions will be asked of you. You may catch Johnnie "masturbating" at his desk (he really can't, you know, until he has reached puberty). You may hear of a little group of your pupils engaging in sex-play behind the bill-board after school. These will be the times to avoid extremes in your reactions. Questions should be answered calmly and objectively in terms understandable to the child. A shocked and violent reaction to your discoveries is worse than no reaction at all; but some disapproval without alarm should be made manifest and at the same time some other diverting activity should be substituted if possible. A child responds well to ideals of more mature behavior—"only babies do this; big kids do thus." The manner in which you meet these situations is what counts. Your own attitudes are imparted to the child and color his attitudes for the rest of his life. Sometimes you can obtain help from the nurse or doctor or counsellor. Sometimes unusual sex behavior indicates an emotional conflict in the child and you will need more special help.

Sex Instruction.

Sex instruction is primarily a function of the home. Since many homes fail in this duty, it may become a function of the school. But both will have difficulty in counteracting whatever misinformation, if any, a child gets from his peers. This has been proved by actual experiment.

There are two strategic points at which sex attitudes are formed and sex information imparted:

(1) The first few years when attitudes in the home are absorbed.

(2) In adolescence when sex-relationships are impending. The curiosity characteristic of the years between can be dealt with by an understanding adult, but is usually a matter of discussion among the child's peers when it does crop out with any force. Here a certain amount of experimentation and play is to be expected, should be understandingly dealt with, disapprovingly, yes, but not alarmingly so.

It is generally agreed that courses in sex instruction as such

are unwise. Physiological subject-matter pertaining to procreation etc. should be given in a proper setting along with related and correlated subjects, e. g., biology, physiology, "wholesome living," etc. Many courses in sex instruction, unless properly oriented, are likely to degenerate into a series of "warnings."

In my experience, relatively few cases of sex delinquency have been due directly to lack of knowledge about sex. When sex does enter into a behavior problem, it is usually for some more complex reason; it may become a substitute for more legitimate satisfactions of which the child is deprived, or it may be the expression of unconscious conflict based upon faulty and unwholesome attitudes toward sex, acquired earlier. At the same time, ignorance, by leaving youth a prey to the unfortunate results of promiscuity, and misinformation, by creating unwholesome attitudes, may make for conflicts and should be dispelled by proper instruction.

Masturbation.

Here again is an undesirable activity whose successful handling depends so much upon the attitudes of interested adults. Technically, real masturbation is not possible before puberty. But let us concede the inclusion of all manipulation of genitals in our definition. In the younger child this is a quite normal activity which will soon be superseded by something more interesting and challenging. It is only when masturbation acquires a special value for the child that it may continue and become harmful. Such value may accrue in the absence of enough normal stimulating satisfactions. Strong, vigorous, active children of high intelligence frequently fall in this category; they crave and need more diverse and absorbing activity attuned to their capacities and inclinations: dancing, sports, hobbies, etc. An unhappy and rejected child often finds solace in the pleasureable sensations of genital manipulation; if such unhappiness persists there may be a real danger, not in the continued masturbation *per se,* but in an increasing withdrawal from normal social contacts into an unhealthy solitude. Sometimes such children go on into realms of phantasy and become quite different, even abnormal. It is from such cases that the prevalent superstition arises: "Masturbation causes insanity." The cause lies deeper; masturbation is only a symptom, but unfortunately an activity, pleasurable absorption in which can prevent the direction of the child's interest into something more social and acceptable.

Another "special value" may be found in the concern that this activity calls out in the parent. Children who experience but little affection and security coming from the parents will turn to almost any form of behavior in order to get some sort of response, even though it may be a thrashing at times. At least a thrashing indi-

cates some concern on the part of the parent and few things can call out the parent's concern and worry more thoroughly and convincingly than masturbation. Not a few children experience some satisfaction from the power they hold over and the punishment they can thus inflict upon papa and mama.

Masturbation in the adolescent is a subject that cannot be dealt with summarily but requires more detailed and far-reaching treatment. It has too many meanings and phases, all the way from complete normality on the one hand to psychotic refuge in phantasy on the other. Such cases should be discussed with specialists.

Finally, we need to consider our own inadequacies as sex educators. The glaringly undesirable things like promiscuity, prostitution, and venereal disease we should do our best to combat by education. But no one yet knows all the answers. Perhaps the most important thing is to decide upon our own attitudes in the light of our best knowledge, and then be consistent and develop a sense of proportion, avoiding the extremes of overemphasis and of complete ignoring of the subject. The way in which we ourselves think and feel about sex will in large measure determine our ability to meet sex problems as they arise in the children entrusted to us; our real attitudes will carry a conviction far greater than the words in which we endeavor to cloak them.

* * * * *

NOTE

Planning For School Health; The State of Illinois under the auspices of its Department of Public Health, has launched an interesting and most promising project of studying school health conditions and programs in the state, and for developing a more adequate set of procedures to improve those conditions. There has been organized a Joint Committee on Health in Schools. On this Committee are representatives of public health; public schools, the Illinois State Medical Society, State Dental Society, the State University, the State Teachers Colleges, the Illinois Education Association, and the Physical Education Association.

To assist the Joint Committee in a thorough scientific study Dr. Clair E. Turner, Professor of Public Health at the Massachusetts Institute of Technology and recently President of the American School Health Association, is being brought to the state as advisor. We shall watch this study and for the report of the Committee with great interest, since it is the first really cooperative effort in the field of school health undertaken by any state. C. H. K.

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EDITORIAL

Health in rural schools is undoubtedly the weakest spot in our whole school health program.

Much of this unfortunate situation is, to be sure, due to the isolation of the rural school, to the small number of pupils in each school, and to a wholly inadequate sum set aside for rural education. These conditions, particularly lack of sufficient funds, result in poorly constructed and antiquated buildings, lack of proper sanitary facilities, unsafe drinking water, a teaching staff that is insufficiently paid and therefore, on the average, made up of poorly trained (especially in matters pertaining to health) and inexperienced teachers. In addition to these conditions, which in themselves make adequate and modern health protection well nigh impossible, no provision is made for school health services of any kind, no nurses, physicians, dental services, or other forms of health supervision are available, and with the present setup and lack of financial support these seem not to be possible. Probably local taxation alone could not support an effective program.

A legal compulsory provision of state aid to small and financially weak local school districts, the amount of such aid for each school district based largely on the amount of taxable wealth per school child in the district—the less the proportionate wealth the greater the percentage of school expense to be borne by the state—and a fixed minimum percentage of this state aid to be used for

better health facilities and for a more adequate school health personnel is the first essential.

The second is to place the supervision and responsibility for the effective functioning of such a program in a large enough governmental unit so that real planning and supervision may be developed. "What is everybody's business is nobody's business." What is nobody's business is not done.

For some years the Commonwealth of Pennsylvania, through its Department of Public Instruction has been organizing and supporting supervisory districts for special education. Often these are on a county basis. In some cases, several counties are put in a single district. Specialists are employed to organize and supervise special education in each of these districts. To this writer there seems apparent no reason why similar provisions for county or larger districts should not be organized and financed for school health betterment. In states whose educational administration is organized largely with the county as the basic unit, each county having a county superintendent of schools, it is simple administratively to fit county organization of school health service and health education into such a county type of supervision. In other states, these could be organized definitely as a state procedure, although this writer is one who believes thoroughly that schools should be controlled locally rather than by the states or nation in so far as such local control is administratively possible.

The cities and the state itself have a peculiar interest in better rural school health. A large proportion of rural children on reaching the adult and commercial or industrial age gravitate to the cities. Arriving there in poor health, with ingrained concepts of poor standands of living, and with poor or little knowledge of healthful living they tend to increase the burdens of the cities and of the state for medical care, clinics, hospitals, and sanitoria.

North Carolina, for some years has been showing the way. Next in value to a far sighted leader is an intelligent follower. —C. H. K.

* * * * *

ABSTRACTS

Physical Fitness Through Health Education—from the U. S. Office of Education in the Federal Security Agency. 98 pages. Issued October 1943. Available from the Superintendent of Documents. Price 20c.

This High School Victory Corps Manual in the field of health education was prepared by a Committee on Wartime Health Education for High Schools, brought together by the Office of Education. It follows an earlier Manual on Physical Fitness Through

Physical Education. It is not a textbook or a course of study. "This manual is intended to be suggestive only and not prescriptive." It recommends instruction through direct health teaching, integrated courses, and health units in other courses of the curriculum. It also recognizes the health education significance of the school experiences of the student outside of formal instruction during his contact with the school environment, the school health services, and the routine work day. Suggestions are made concerning the organization of the high school for health education.

The publication sets as the major health objectives for the wartime emergency program, the correction of remediable defects, the prevention and control of communicable diseases, improvement in nutrition, prevention of accidents and training to assist in giving emergency care, daily program planning for balanced living, and the development of sound mental attitudes. It gives specific suggestions concerning a plan for administrative action in the high school which emphasizes fixing responsibility, the provision of adequate time and opportunity for health instruction, the detection and correction of defects, the provision of a healthful school environment, the adequate training of teaching personnel and the study and utilization of community health agencies.

The ten chapters deal with the correction of physical impairments, the prevention and control of disease, better nutrition, prevention of accidents and emergency care, daily program planning for balanced living, developing sound mental attitudes, air, land and sea services, production services, community services, and a plan for administrative action.

The material is clearly and attractively presented, logically organized, and conveniently arranged. It will be useful to the high school principal, to the teachers of health in the senior high school, to the teachers of other subjects such as biology, physical education, home economics, agriculture, industrial training and social studies, which include units dealing with health instruction. It has a special value in assisting to adapt the organized, instructional program to wartime interests and immediate needs.

The importance of health instruction in high schools is becoming more widely recognized. Some states have recently added the requirement of a course of health instruction as a constant for all pupils at the secondary school level. The recent Yearbook of the American Association of School Administrators (*Health in Schools*, page 73) says: "The plan of separate courses has particular merit in the senior high school and is recommended as the most effective means of providing an adequate program. . . . Concepts of racial improvement, public health, and adequate personal

and social living are the sources of curriculum materials. Such a course is most profitable in the junior or senior year in high school. It should meet daily for at least one semester, preferably for two, and be recognized as on a par with other school offerings." The school administrators were visualizing the need for better health instruction as a permanent peacetime procedure. Certainly the war emergency accentuates the need for developing healthful and effective living. This splendid contribution of the Office of Education and their excellent Advisory Committee should go far in strengthening our expanding health education program. Every senior high school should have a copy. —C. E. Turner.

* * * * *

Physical Efficiency Among Soldier Trainees Shows Improvement.—The War Department, Washington, D. C., announced on October 2 an average improvement of 21 per cent in physical efficiency among soldier trainees in the first term of participation in the Army Specialized Training Program. Performances were recorded in seven events among 2,557 trainees at the twelve institutions in which the program had its inception, both at the start of the course and approximately three months later. Gains in various events ranged from 6 to 30 per cent. Trainees devote six hours weekly to physical training.

* * * * *

Tuberculosis—Dr. Esmond R. Long of the Henry Phipps Institute of the University of Pennsylvania and Dr. Robert E. Plunkett of New York State Department of Health are quoted thus in a recent issue of Consumer Reports, published by Consumers Union: "A grave menace exists of another world-wide recrudescence of tuberculosis. Its prevention will require vigorous effort against the spread of infection and all measures possible to maintain a high level of resistance to disease."—The Journal Lancet, Oct. 1943, p. 333.

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REVIEW

Whooping Cough. By Joseph H. Lapin, B. Chem., M.D., Adjunct Pediatrician, Bronx Hospital, Associate in Contagion, Riverside Hospital for Contagious Diseases, New York. First Edition, pp. 238.

"Responsible for more deaths than any of the other diseases of childhood" is the author's adequate reason for bringing out this compact volume, useful to all having school health interests. The book summarizes and digests most of the world's important literature on whooping cough and presents it with the author's experienced comments. Unnecessary background has been wisely

omitted. Emphasis is on the new in theory and practice. School principals, doctors, teachers, health educators, and others will find it full of such pertinent information as the following:

73.5% of 30,000 school children had pertussis up to the seventeenth year.

60% to 80% of exposed children acquired the disease.

"Death rate varies at each age—greatest under five years of age."

Transmission:

"The spread of the disease seems to depend on droplets from mouth and nasal spray. The infective distance has been placed at five feet.

The disease may be carried by a third person, an article of clothing, dishes, etc. . . . droplets may be suspended in the air up to three hours."

"71.3% of cases were infected by children in the catarrhal stage." . . .

". . . children are no longer contagious after four to six weeks from the start of the disease . . . However, there are some cases that are still contagious long after the cited six weeks' limit."

The author defines *prophylaxis* as immunization of humans before actual exposure. The various immunizing agents as vaccine, vaccine fractions, "toxin vaccine," alum precipitated vaccine, detoxified pertussis vaccine, Sauer's vaccine, and others are amply described and evaluated as accurately as accumulated data to date allow. Reactions to these agents are described, failures are noted and explanations thereof quoted and commented on.

Specific *treatment* (vaccines and sera) is adequately described. Hyperimmune human whooping cough serum is well thought of by the author. Under *non-specific treatment* he mentions "systemic medication has been practiced with such a bewildering variety of drugs and rarely, if ever, in controlled studies . . ." Most of the newer remedies (as Benzyl Benzoate; Ephedrine) have proven disappointing.

From all the treatments mentioned many valuable suggestions may be gleaned, and the chapter on complications is up-to-date, including indications for the use of such remedies as sulfa drugs and convalescent, hyperimmune and antitoxic sera.

The last brief chapter is on "Public Health Recommendations" and presents Haven Emerson's detailed list of recommended procedures arising from the survey of thirty-two representative United States cities. This short chapter alone makes this book a "must" in school health literature.—Marvin Israel, M.D.

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